

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (original) A spark plug comprising:
 - a center electrode having a tip;
 - a ground electrode having a center electrode-opposed surface facing the tip of said center electrode;
 - a noble metal member having a given length and a first and a second end opposed to each other through the length, said noble metal member being joined at the first end to the center electrode-opposed surface of said ground electrode by laser welding so as to oppose the second end to the tip of said center electrode through a spark gap; and
 - a fused portion that forms a weld of said noble metal member and said ground electrode formed by materials of said ground electrode and said noble metal member melted together,
 - wherein a sectional area of said noble metal member traversing the length thereof is greater than or equal to 0.1mm^2 and smaller than or equal to 0.6mm^2 ,
 - wherein an unfused sectional area percentage that is a percentage of a sectional area of an unfused portion of the first end of said noble metal member within a range of a sectional area of said noble metal member closest to said fused portion traversing the length of said noble metal member is less than or equal to 50%, and
 - wherein a melt angle that is an angle which a line extending through said fused portion along a maximum depth of said fused portion makes with the center electrode-opposed surface of said ground electrode is less than or equal to 60° .
2. (original) A spark plug as set forth in claim 1, wherein if a point at which the line extending along the maximum depth of said fused portion intersects an outer

surface of said fused portion is defined as an intersection F , and a distance between the intersection F and the center electrode-opposed surface of said ground electrode is defined as an intersection-to-surface distance y , the intersection F is located within a range of -0.2mm to 0.3mm where when the intersection F is located outside the center electrode-opposed surface of said ground electrode, the intersection-to-surface distance y is expressed in a plus value (+), and when the intersection F is located inside the center electrode-opposed surface of said ground electrode, the intersection-to-surface distance y is expressed in a minus value (—), and wherein said melt angle is less than or equal to $(30 + 100y)^{\circ}$.

3. (original) A spark plug as set forth in claim 1, wherein if a width of a portion of said noble metal member closest to said fused portion is defined as D , the maximum depth of said fused portion is less than or equal to $1.4D$.

4. (original) A spark plug as set forth in claim 1, wherein said noble metal member is made from one of a first material containing a main component of 50Wt% or more of Pt and an additive of at least one of 25 Rh, Ir, Os, Ni, W, Pd, and Ru and a second material containing a main component of 50Wt% or more of Ir and an additive of at least one of Rh, Pt, Os, Ni, W, Pd, and Ru.

5. (original) A spark plug comprising:
a metal shell;
a center electrode retained in said metal shell to be insulated from said metal shell, said center electrode having a tip exposed outside said metal shell;
a ground electrode installed on said metal shell, said ground electrode having a tip which has a center electrode-opposed side surface facing the tip of said center electrode and an end surface; and
a noble metal member that is at least partially embedded in the end surface of said ground electrode and joined to said ground electrode by laser welding through a

fused portion that forms a weld of said noble metal member and said ground electrode formed by materials of said ground electrode and said noble metal member melted together, said noble metal member having a tip projecting from the center electrode-opposed side surface of said ground electrode toward said center electrode so as to define a spark gap between the tip of said noble metal member and the tip of said center electrode.

6. (original) A spark plug as set forth in claim 5, wherein if a width of a portion of said noble metal member closest to said fused portion in a direction perpendicular to the end surface of said ground electrode is defined as $D1$, a depth of a portion of said noble metal member embedded in the end surface of said ground electrode is greater than or equal to $0.5D1$.

7. (original) A spark plug as set forth in claim 5, wherein said noble metal chip has a length, and a sectional area of said noble metal member traversing the length thereof is greater than or equal to 0.1mm^2 and smaller than or equal to 0.6mm^2 .

8. (original) A spark plug as set forth in claim 5, wherein if a width of a portion of said noble metal member closest to said fused portion in a direction perpendicular to the end surface of said ground electrode is defined as $D1$, a width of said portion of said noble metal member in a direction parallel to the end surface of said ground electrode is defined as $D2$, a width of said fused portion is defined as N , and a maximum depth of said fused portion is defined as H , the maximum depth H is smaller than or equal to $2D1$, and the width N is smaller than or equal to $2.5D2$.

9. (original) A spark plug as set forth in claim 8, wherein a depth of a portion of said noble metal member embedded in the end surface of said ground electrode is greater than or equal to $0.5D1$.

10. (original) A spark plug as set forth in claim 5, wherein said noble metal member is made from one of a first material containing a main component of 50Wt% or more of Pt and an additive of at least one of Rh, Ir, Os, Ni, W, Pd, and Ru and a second material containing a main component of 50Wt% or more of Ir and an additive of at least one of Rh, Pt, Os, Ni, W, Pd, and Ru.

Claims 11 and 12. (canceled)

13. (Previously presented) A spark plug as set forth in claim 1, further comprising a metal shell having a thread formed in an outer periphery thereof, a porcelain insulator installed in said metal shell to have a tip projecting from an end of said metal shell, said porcelain insulator having a length and an inner chamber extending along the length thereof, wherein said center electrode is disposed within the inner chamber of said center electrode to have a tip projecting from the tip of said porcelain insulator, and wherein said ground electrode has an L-shape which includes a base end welded to the end of said metal shell and a tip, the tip of said ground electrode having a side surface defining the center electrode-opposed surface which faces the tip of said center electrode through the spark gap.

14. (Previously presented) A spark plug as set forth in claim 5, further comprising a metal shell having a thread formed in an outer periphery thereof, a porcelain insulator installed in said metal shell to have a tip projecting from an end of said metal shell, said porcelain insulator having a length and an inner chamber extending along the length thereof, wherein said center electrode is disposed within the inner chamber of said center electrode to have a tip projecting from the tip of said porcelain insulator, and wherein said ground electrode has an L-shape which includes a base end welded to the end of said metal shell and a tip, the tip of said ground electrode having a side surface defining the center electrode-opposed surface which faces the tip of said center electrode through the spark gap.

15. (New) A spark plug comprising:
a center electrode having a tip;
a ground electrode having a center electrode-opposed surface facing the tip of said center electrode;
a noble metal member having a given length, a first end joined to the ground electrode by laser welding and a second end having an end face defining a spark gap with the tip of said center electrode; and
a fused portion that forms a weld of said noble metal member and said ground electrode formed by materials of said ground electrode and said noble metal member melted together,
wherein a sectional area of said noble metal member traversing the length thereof is greater than or equal to 0.1mm^2 and smaller than or equal to 0.6mm^2 ,
wherein an unfused sectional area percentage that is a percentage of a sectional area of an unfused portion of the first end of said noble metal member within a range of a sectional area of said noble metal member closest to said fused portion traversing the length of said noble metal member is less than or equal to 50%, and
wherein a melt angle that is an angle which a line extending through said fused portion along a maximum depth of said fused portion makes with the center electrode-opposed surface of said ground electrode is less than or equal to 60° .

16. (New) A spark plug as set forth in claim 15, wherein a longitudinal axis of the noble metal member laser welded to the ground electrode is disposed so as to be substantially perpendicular to the center electrode-opposed surface of said ground electrode.

17. (New) A spark plug as set forth in claim 15, wherein a longitudinal axis of the noble metal member laser welded to the ground electrode is disposed at an angle

of less than 90° with respect to a plane of said center electrode-opposed surface of said ground electrode.

18. (New) A spark plug as set forth in claim 15, wherein a longitudinal axis of the noble metal member laser welded to the ground electrode is disposed at an angle greater than 90° with respect to a plane of said center electrode-opposed surface of said ground electrode.

19. (New) A spark plug as set forth in claim 15, wherein said first end of said noble metal member is laser welded to said center electrode-opposed surface of said ground electrode so as to project therefrom towards said tip of said center electrode.

20. (New) A spark plug as set forth in claim 15, wherein said noble metal member is laser welded to a distal end surface of said ground electrode.

21. (New) A spark plug as set forth in claim 20, wherein said ground electrode has a groove formed in said distal end surface thereof and extending in a thickness-wise direction of the ground electrode toward the center electrode, said noble metal member being disposed at least partially within said groove with said second end projecting beyond said center electrode-opposed surface of said ground electrode and said noble metal member is laser welded to said groove.

22. (New) A spark plug as set forth in claim 20, wherein if a width of a portion of said noble metal member closest to said fused portion in a direction perpendicular to the end surface of said ground electrode is defined as $D1$, a depth of a portion of said noble metal member embedded in the end surface of said ground electrode is greater than or equal to $0.5D1$.